THE CLAIMS

What is claimed is:

1   1.   A method for controlling media access in a wireless telecommunications

2   network, the telecommunications network including a plurality of base stations and at least

3   one wireless station that is communicating with a base station of the plurality of base

4   stations, the method comprising the steps of:

5   receiving a paging message at the wireless station when a data packet is

6   pending for downlink transmission to the wireless station;

7   detecting a level of each of a plurality of pilot frequency signals at the wireless

8   station, each pilot frequency signal corresponding to a downlink traffic channel and being

9   transmitted by each base station of the plurality of base stations to which the downlink traffic

10   channel is assigned;

11   generating a list of preferred traffic channels based on detected levels of the

12   pilot frequency signals; and

13   transmitting the list of preferred traffic channels to the base station.

1   2.   The method according to claim 1, where the step of detecting the level of each

2   of the plurality of pilot frequency signals is based on a fast Fourier transform performed on

3   the plurality of pilot frequency signals.

1   3.   The method according to claim 2, further comprising the steps of:

2   receiving a downlink traffic channel assignment for the wireless station at the

3   wireless station; and

4   receiving the data packet at the wireless station using the assigned downlink

5   traffic channel.

1   4.   The method according to claim 3, wherein the step of generating the list of

2   preferred traffic channels is performed at the wireless station and includes the step of

3   determining the list of preferred traffic channels according to a priority order.

1   5.   The method according to claim 3, wherein each downlink traffic channel

2   includes a timeslot and a traffic carrier frequency.

1   6.   The method according to claim 5, wherein the paging message is received

2   during a first predetermined timeslot of a frame having a plurality of timeslots, and

3   wherein the list of preferred traffic channels is transmitted during a second

4   predetermined timeslot of the frame.

1   7.   The method according to claim 6, wherein the frame is one of a predetermined

2   number of frames in a superframe.

1   8.   The method according to claim 7, wherein the wireless station is a mobile

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2   station.

1   9.   The method according to claim 7, wherein the wireless station is a fixed

2   station.

1   10.   A method for controlling media access in a wireless telecommunications

2   network, the telecommunications network including a plurality of base stations and at least

3   one wireless station that is communicating with a base station of the plurality of base

4   stations, the method comprising the steps of:

5   transmitting a paging message to the wireless station when a data packet is

6   pending for downlink transmission from the base station to the wireless station; and

7   receiving a list of preferred traffic channels for the wireless station at the base

8   station.

1   11.   The method according to claim 10, further comprising the step of assigning a

2   downlink traffic channel for downlink transmitting the received data packet to the wireless

3   station based on the list of preferred traffic channels.

1   12.   The method according to claim 11, wherein the step of assigning the downlink

2   traffic channel is based on a list of preferred traffic channels received from each mobile

3   station associated with the base station and having packets pending for downlink

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4   transmission.

1   13.   The method according to claim 12, further comprising the steps of:

2   transmitting the assigned downlink traffic channel to the wireless station;

3   transmitting the data packet from the base station to the wireless station using

4   the assigned downlink traffic channel; and

5   transmitting a pilot frequency signal corresponding to the assigned downlink

6   traffic channel.

1   14.   The method according to claim 13, further comprising the steps of:

2   generating a preferred traffic channel priority order list for the wireless station

3   at the base station; and.

4   updating the preferred traffic channel priority order list at the base station

5   based on the list of preferred traffic channels transmitted to the base station.

1   15.   The method according to claim 14, wherein the channel priority order list is

2   for all wireless stations communicating with the base station.

1   16.   The method according to claim 14, wherein each downlink traffic channel

2   includes a timeslot and a traffic carrier frequency.

1   17.   The method according to claim 14, wherein the paging message is transmitted

2 during a first predetermined timeslot of a frame having a plurality of timeslots, and

3   wherein the list of preferred traffic channels is received during a second

4 predetermined timeslot of the frame.

1   18.   The method according to claim 17, wherein the frame is one of a

2 predetermined number of frames in a superframe,

3   wherein the plurality of base stations are grouped into the predetermined

4 number of groups, each group of base stations being associated with a frame of the

5 superframe, and

6   wherein the steps of the method are performed by the base stations of a group

7 of base stations during the frame associated with the group.

1   19.   · The method according to claim 18, wherein the base stations of each group of

2 base stations are geographically separated from other base stations of the group for

3 minimizing co-channel interference between base stations of the group.

1   20.   The method according to claim 19, wherein the wireless station is a mobile

2 station.

1   21.   The method according to claim 19, wherein the wireless station is a fixed station.

1   22.   A wireless packet communication system, comprising:

2   a plurality of wireless stations; and

3   a plurality of base stations connected to a telecommunications network, each

4 base station transmitting a paging message to a wireless station of the plurality of wireless

5 stations associated with the base station when the base station receives a data packet for

6 downlink transmission to the wireless station, the base station transmitting a pilot frequency

7 signal corresponding to a downlink traffic channel when the base station transmits the data

8 packet to the wireless station using the downlink traffic channel, the downlink traffic channel

9 being one of a plurality of downlink traffic channels, and the pilot frequency signal being one

10 of a plurality of pilot frequency signals respectively corresponding to the downlink traffic

11 channels;

12   the wireless station detecting a level of a plurality of the pilot frequency

13 signals in response to receiving the paging message, generating a list of preferred traffic

14 channels based on detected levels of the pilot frequency signals.

23.   The system according to claim 22, wherein the wireless station transmits the list of preferred traffic channels to the base station.

1   24.   The system according to claim 23, wherein the base station assigns the

2 downlink traffic channel for downlink transmitting the received data packet to the wireless

3 station based on the list of preferred traffic channels.

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1   25.   The system according to claim 24, wherein the base station transmits the

2   assigned downlink traffic channel to the wireless station, transmits the data packet to the

3   wireless station using the assigned downlink traffic channel, and transmits the pilot frequency

4   signal corresponding to the assigned downlink traffic channel.

1   26.   The system according to claim 25, wherein the wireless station arranges the

2   list of preferred traffic channels in a priority order when the list of preferred traffic channels

3   is generated.

1   27.   The system according to claim 26, wherein the base station generates a

2   preferred traffic channel priority order list for all wireless stations communicating with the

3   base station, and updating the preferred traffic channel priority order list based on the list of

4   preferred traffic channels transmitted to the base station.

1   28.   The system according to claim 25, wherein each downlink traffic channel

2   includes a timeslot and a traffic carrier frequency.

1   29.   The system according to claim 28, wherein base station transmits the paging

2   message during a first predetermined timeslot of a frame having a plurality of timeslots, and

3   wherein the wireless station transmits the list of preferred traffic channels

4   during a second predetermined timeslot of the frame.

1   30.   The system according to claim 29, wherein the frame is one of a

2   predetermined number of frames in a superframe,

3   wherein the plurality of base stations are grouped into the predetermined

4   number of groups, each group of base stations being associated with a frame of the

5   superframe, and

6   wherein the base stations of a group of base stations transmit paging messages

7   during the frame associated with the group when a base station of the group has a data packet

8   for downlink transmission for a wireless station.

1   31.   The system according to claim 30, wherein the base stations of each group of

2   base stations are geographically separated from other base stations of the group for

3   minimizing co-channel interference between base stations of the group.

1   32.   The system according to claim 31, wherein the wireless station is a mobile

2   station.

1   33.   The system according to claim 31, wherein the wireless station is a fixed

2   station.

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1   34.   A wireless station comprising:

2   a receiver receiving a paging message, the paging message indicating that a

3   data packet is pending for downlink transmission to the wireless station;

4   a pilot frequency signal scanner scanning a pilot frequency band in response to

5   the paging message for determining whether any downlink channels are available for

6   downlink transmitting the data packet to the wireless station, the pilot frequency band having

7   pilot frequency signals, each pilot frequency signal corresponding to a downlink channel; and

8   a transmitter transmitting a message indicating available downlink channels for

9   downlink transmitting the data packet.

1   35.   The wireless station according to claim 34, further comprising a channel

2   selection processor selecting available downlink channels based on detected levels of pilot

3   frequency signals.

1   36.   The wireless station according to claim 35, wherein the pilot frequency signal

     scanner uses a fast Fourier transform for scanning the pilot frequency band.

1   37.   The wireless station according to claim 36, wherein the receiver further

2   receives an assignment message, the assignment containing a downlink channel assignment in

3   which the data packet will be downlink transmitted.

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1   38.   The wireless station according to claim 37, wherein the channel selection

2   processor selects available downlink channels further based on a priority ordering of selected

3   downlink channels.

1   39.   The wireless station according to claim 38, wherein the paging message further

2   includes information relating to a priority ordering of downlink channels for the wireless

3   station.

1   40.   A base station comprising:

2   a transmitter transmitting a paging message to a wireless station when a data

3   packet is pending for downlink transmission from the base station to the wireless station, the

4   paging message including information relating to the data packet pending for downlink

5   transmission; and

6   a receiver receiving a list of preferred traffic channels for the wireless station

7   for downlink transmission of the data packet.

1   41.   The base station according to claim 40, further comprising an assignment

2   message assembler generating an assignment message based on the list of preferred traffic

3   channels, the assignment message including information relating to a downlink traffic channel

4   assigned to the wireless station for downlink transmitting the data packet to the wireless

5   station, and

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6   wherein the transmitter transmits the assignment message to the wireless

7   station.

1   · 42.   The base station according to claim 41, wherein the transmitter downlink

2   transmits the data packet to the wireless station using the assigned downlink traffic channel.

1   43.   The base station according to claim 42, wherein the transmitter transmits a

2   pilot frequency signal when the data packet is downlink transmitted to the mobile station, the

3   pilot frequency signal corresponding to the assigned downlink traffic channel.

1   44.   The base station according to claim 43, wherein the wireless station is a

2   mobile station.

1   45.   The base station according to claim 43, wherein the wireless station is a fixed

2   station.

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1   46.   The base station according to claim 43, wherein the wireless station is one of a

2   plurality of wireless stations communicating with the base station,

3   wherein the paging message includes information for each mobile station of the

4   plurality of mobile stations having a data packet pending for downlink transmission from the

5   base station, and

6   wherein the receiver receives a list of preferred traffic channels from each

7   wireless station having a pending data packet.

1   47.   The base station according to claim 46, wherein the assignment message

2   assembler generates the assignment message based on all lists of preferred traffic channels

3   received from mobile stations having a pending data packet, the assignment message

4   including information relating to a downlink traffic channel assigned to each respective

5   wireless station having a pending data packet, and

6   wherein the transmitter transmits the assignment message to the mobile stations

7   having a pending data packet.

1   48.   The base station according to claim 47, wherein the transmitter transmits each

2   respective data packet using the downlink traffic channel assigned to mobile station for which

3   the data packet is pending and transmits a pilot frequency signal corresponding to each

4   assigned downlink traffic channel used for downlink transmitting each respective pending

5   data packet.

1   49.   The base station according to claim 48, further comprising a channel list buffer

2   storing a preferred traffic channel priority order list for the plurality of wireless stations, the

3   channel list buffer updating the preferred traffic channel priority order list based on all lists

4   of preferred traffic channels received from the mobile stations having a pending data packet.

1   50.   The base station according to claim 49, wherein each downlink traffic channel

2   includes a timeslot and a traffic carrier frequency.

1   51.   The base station according to claim 50, wherein the transmitter transmits the

2   paging message during a first predetermined timeslot of a frame having a plurality of

3   timeslots, and

4   wherein the receiver receives the list of preferred traffic channels during a

5   second predetermined timeslot of the frame.

52.   The base station according to claim 51,

wherein the frame is one of a predetermined number of frames in a superframe,

wherein the base station is one of a plurality of base stations being grouped

into the predetermined number of groups, each group of base stations being associated with a

frame of the superframe, and

wherein the transmitter of each respective base station transmits the paging

8   message during the frame associated with the group.

1   53.   The base station according to claim 52, wherein the base stations of each

2   group of base stations are geographically separated from other base stations of the group for

3   minimizing co-channel interference between base stations of the group.